

Patent Claims

1. A component (1) made from an alloy,
which includes precipitations,

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characterized in that

the alloy contains at least one strength promoter in an amount
of from 50 ppm to 2000 ppm,

10 which boosts the strength of the component (1) made from the
alloy,

in particular by increased formation of the precipitations,
the at least one strength promoter being selected from the
group consisting of zinc (Zn), tin (Sn), lead (Pb), gallium
15 (Ga), calcium (Ca), selenium (Se), arsenic (As), bismuth (Bi),
neodymium (Nd), praseodymium (Pr), aluminum oxide (Al_2O_3),
magnesia (MgO), hafnia (HfO_2), zirconia (ZrO_2), spinels
(MgAl_2O_4), carbides or nitrides.

20 2. The component as claimed in claim 1,
characterized in that

the component (1) consists of a nickel-base, cobalt-base or
iron-base superalloy.

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3. The component as claimed in claim 1,
characterized in that

the alloy contains up to 1100 ppm of strength promoter.

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4. The component as claimed in claim 1 or 3,
characterized in that

the alloy contains from 100 to 500 ppm of strength promoter.

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5. The component as claimed in claim 1,
characterized in that

the alloy contains approximately 100 ppm of strength promoter.

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6. The component as claimed in claim 1,
characterized in that

the strength promoter is metallic.

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7. The component as claimed in claim 1,
characterized in that

the strength promoter is ceramic.

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8. The component as claimed in claim 2,
characterized in that
the alloy, in addition to the strength enhancer, comprises the
following elements in wt%:

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11 - 13% chromium

3 - 5% tungsten

0.5 - 2.5% molybdenum

3 - 5% aluminum

3 - 5% titanium

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3 - 7% tantalum

0 - 12% cobalt

0 - 1% niobium
0 - 2% hafnium
0 - 1% zirconium
0 - 0.05% boron

5 0 - 0.2% carbon

0.1 - 10% rhenium or ruthenium

remainder nickel, cobalt or iron and impurities.

9. The high-temperature-resistant component (1) as claimed in
10 claim 2,
characterized in that

in addition to the strength enhancer, the alloy comprises the
following elements, in wt%:

15 9 - <11% chromium

3 - 5% tungsten

0.5 - 2.5% molybdenum

3 - 5% aluminum, in particular 3 - <3.5% aluminum,

3 - 5% titanium

20 3 - 7% tantalum

0 - 12% cobalt

0 - 1% niobium

0 - 2% hafnium

0 - 1% zirconium

25 0 - 0.05% boron

0 - 0.2% carbon

0.1 - 5% ruthenium, rhenium

remainder nickel, cobalt or iron and impurities.

30 10. The component as claimed in claim 8 or 9,
in which the rhenium content is at least 1.3 wt%.

11. The component as claimed in claim 8, 9 or 10,
having a maximum ruthenium content in the superalloy of 3 wt%.

12. The component as claimed in claim 8 or 9,
5 having a minimum ruthenium content in the superalloy of 0.5
percent by weight.

13. The component as claimed in one of the preceding claims,
which has a directionally solidified grain structure (9).

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14. The component as claimed in one of the preceding claims,
which has a single-crystal structure.

15. The component as claimed in one of the preceding claims,
15 which has an isotropic distribution of the orientations of the
grain structure.

16. The component as claimed in one of the preceding claims,
which is designed as a turbine blade or vane, in particular as
20 a gas turbine blade or vane (120, 130).

17. The component as claimed in one of the preceding claims,
which is designed as a combustion chamber part (155).

25 18. The component as claimed in claim 2, 8 or 9,
characterized in that

the precipitation is the γ' phase.

19. The component as claimed in claim 1, 3, 4 or 5
characterized in that

the strength promoter is present in an amount of at least
5 50 ppm, in particular at least 75 ppm.